2310e and 2310ei LCD Monitors

User Guide

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About This Guide

This guide provides information on setting up the monitor, installing drivers, using the on-screen display menu, troubleshooting and technical specifications.

⚠ **WARNING!** Text set off in this manner indicates that failure to follow directions could result in bodily harm or loss of life.

△ **CAUTION:** Text set off in this manner indicates that failure to follow directions could result in damage to equipment or loss of information.

NOTE: Text set off in this manner provides important supplemental information.

Table of contents

1 Product Features 1

HP 2310e/2310ei LCD Monitors 1

2 Safety and Maintenance Guidelines 3

Important Safety Information 3

Safety Precautions 4

Maintenance Guidelines 4

Cleaning the Monitor 5

Shipping the Monitor 5

3 Setting Up the Monitor 6

Unpacking the Monitor 6

Assembling the Monitor 6

Connecting Monitor Cables 8

Connecting the DVI-D Video Cable 8

Connecting the DisplayPort Video Cable 9

Connecting the HDMI Cable (2310e Model Only) 9

Connecting the Power Cord 10

High-Bandwidth Digital Content Protection (HDCP) 10

Turning on the Monitor 11

Selecting Video Input Connectors 11

Adjusting The Tilt 11

Adjusting the Swivel 12

4 Operating the Monitor 13

CD Software and Utilities 13

Installing Drivers 13

Front-Panel Controls 14

Using the On-Screen Display (OSD) 15

Identifying Monitor Conditions 19

Power-Saver Feature 20

Appendix A Troubleshooting 21
Solving Common Problems 21
Getting Support from hp.com 22
Preparing to Call Technical Support 22
Locating the Rating Label 23

Appendix B Technical Specifications 24
HP LCD Monitors 24
Preset Video Modes 25
Entering User Modes 25
LCD Monitor Quality and Pixel Policy 26

Appendix C Agency Regulatory Notices 27
Federal Communications Commission Notice 27
Modifications 27
Cables 27
Declaration of Conformity for Products Marked with the FCC Logo (United States Only) 27
Canadian Notice 28
Avis Canadien 28
European Union Regulatory Notice 28
German Ergonomics Notice 29
Japanese Notice 29
Korean Notice 29
Power Cord Set Requirements 29
Japanese Power Cord Requirements 30
Product Environmental Notices 30
ENERGY STAR® Qualification 30
Disposal of Waste Equipment by Users in Private Household in the European Union 31
Chemical Substances 31
HP Recycling Program 31
Restriction of Hazardous Substances (RoHS) 31
Turkey EEE Regulation 32

1 Product Features

HP 2310e/2310ei LCD Monitors

Figure 1-1 HP 2310e/2310ei LCD Monitors

The HP 2310e/2310ei LCD (liquid crystal display) monitors have an active matrix, thin-film transistor (TFT) screen with a white LED backlight and the following features:

- Large diagonal display
- Maximum graphics resolution: 1920 x 1080 @ 60Hz, plus full-screen support for lower resolutions
- DisplayPort digital input signal
- DVI digital input signal with single-link DVI-D to DVI-D cable provided
- High-definition multimedia interface (HDMI) (2310e model only) signal input
- Fast response time, providing better experience for hardcore gaming and graphics
- Easy viewing from a sitting or standing position, or while moving from one side of the monitor to the other
- Dynamic Contrast Ratio to provide deeper blacks and brighter whites for brilliant shading effects while gaming or watching movies
- Tilt adjustment

- Swivel adjustment
- Plug and Play capability, if supported by your computer system
- On-screen display (OSD) adjustments for ease of setup and screen optimization (choose English, Simplified Chinese, Traditional Chinese, French, German, Italian, Spanish, Dutch, Japanese, or Brazilian Portuguese)
- Power Saver to reduce energy consumption
- Quick View settings display
- HDCP (High Bandwidth Digital Content Protection) on DVI, HDMI and DisplayPort inputs
- Software and utilities CD, containing the following:
    - Drivers
    - Documents

2 Safety and Maintenance Guidelines

Important Safety Information

A power cord is included with the monitor. If another cord is used, use only a power source and connection appropriate for this monitor. For information on the correct power cord set to use with the monitor, refer to the "Connecting the Power Cord" section in Setting Up the Monitor on page 6.

⚠ **WARNING!** To reduce the risk of electric shock or damage to the equipment:

- Do not disable the power cord grounding feature. The grounding plug is an important safety feature.
- Plug the power cord in a grounded (earthed) outlet that is easily accessible at all times.
- Disconnect power from the product by unplugging the power cord from the electrical outlet.

For your safety, do not place anything on power cords or cables. Arrange them so that no one may accidentally step on or trip over them. Do not pull on a cord or cable. When unplugging from the electrical outlet, grasp the cord by the plug.

To reduce the risk of serious injury, read the *Safety and Comfort Guide*. It describes proper workstation, setup, posture, and health and work habits for computer users, and provides important electrical and mechanical safety information. This guide is located on the Web at http://www.hp.com/ergo and/or on the documentation CD, if one is included with the monitor.

⚠ **CAUTION:** For the protection of the monitor, as well as the computer, connect all power cords for the computer and its peripheral devices (such as a monitor, printer, scanner) to some form of surge protection device such as a power strip or Uninterruptible Power Supply (UPS). Not all power strips provide surge protection; the power strips must be specifically labeled as having this ability. Use a power strip whose manufacturer offers a Damage Replacement Policy so you can replace the equipment, if surge protection fails.

Use the appropriate and correctly sized furniture designed to properly support your HP LCD monitor.

⚠ **WARNING!** LCD monitors that are inappropriately situated on dressers, bookcases, shelves, desks, speakers, chests, or carts may fall over and cause personal injury.

Care should be taken to route all cords and cables connected to the LCD monitor so that they can not be pulled, grabbed, or tripped over.

Safety Precautions

- Use only a power source and connection compatible with this monitor, as indicated on the label/back plate of the monitor.
- Be sure the total ampere rating of the products connected to the outlet does not exceed the current rating of the electrical outlet, and the total ampere rating of the products connected to the power cord does not exceed the rating of the power cord. Look on the power label to determine the ampere rating (Amps or A) for each device.
- Install your monitor near a power outlet that you can easily reach. Disconnect the monitor by grasping the plug firmly and pulling it from the outlet. Never disconnect the monitor by pulling the cord.
- Do not allow anything to rest on the power cord. Do not walk on the cord.

Maintenance Guidelines

To enhance the performance and extend the life of the monitor:

- Do not open the monitor cabinet or attempt to service this product yourself. Adjust only those controls that are covered in the operating instructions. If the monitor is not operating properly or has been dropped or damaged, contact an authorized HP dealer, reseller, or service provider.
- Use only a power source and connection appropriate for this monitor, as indicated on the label/back plate of the monitor.
- Be sure the total ampere rating of the products connected to the outlet does not exceed the current rating of the electrical outlet, and the total ampere rating of the products connected to the cord does not exceed the rating of the cord. Look on the power label to determine the ampere rating (AMP or A) for each device.
- Install the monitor near an outlet that you can easily reach. Disconnect the monitor by grasping the plug firmly and pulling it from the outlet. Never disconnect the monitor by pulling the cord.
- Turn the monitor off when not in use. You can substantially increase the life expectancy of the monitor by using a screen saver program and turning off the monitor when not in use.

NOTE: Monitors with a “burned-in image” are not covered under the HP warranty.

- Slots and openings in the cabinet are provided for ventilation. These openings must not be blocked or covered. Never push objects of any kind into cabinet slots or other openings.
- Do not drop the monitor or place it on an unstable surface.
- Do not allow anything to rest on the power cord. Do not walk on the cord.
- Keep the monitor in a well-ventilated area, away from excessive light, heat or moisture.
- When removing the monitor base, you must lay the monitor face down on a soft area to prevent it from getting scratched, defaced, or broken.

Cleaning the Monitor

1. Turn off the monitor and unplug the power cord from the back of the unit.
2. Dust the monitor by wiping the screen and the cabinet with a soft, clean antistatic cloth.
3. For more difficult cleaning situations, use a 50/50 mix of water and Isopropyl alcohol.

△ **CAUTION:** Spray the cleaner onto a cloth and use the damp cloth to gently wipe the screen surface. Never spray the cleaner directly on the screen surface. It may run behind the bezel and damage the electronics.

CAUTION: Do not use cleaners that contain any petroleum based materials such as benzene, thinner, or any volatile substance to clean the monitor screen or cabinet. These chemicals may damage the monitor.

Shipping the Monitor

Keep the original packing box in a storage area. You may need it later if you move or ship the monitor.

To prepare the monitor for shipping:

1. Disconnect the power and video cables from the monitor.
2. Press the button on the front of the pedestal and lift the monitor panel from the base.

Figure 2-1 Removing the Monitor Panel

3. Set the panel on a soft, protected surface.
4. Loosen the screw on the bottom side of the base and remove the pedestal from the base.
5. Place the monitor, pedestal, and base in the original packing box.

3 Setting Up the Monitor

Unpacking the Monitor

1. Unpack the monitor. Make sure all contents are included. Store the packing box.
2. Turn off the computer and other attached devices.
3. Prepare a flat area to assemble the monitor. You may need a flat, soft, protected area for placing the monitor screen-down while preparing it for installation.

Assembling the Monitor

Place the monitor in a convenient, well-ventilated location near your computer. Connect the monitor cables after you have assembled the monitor.

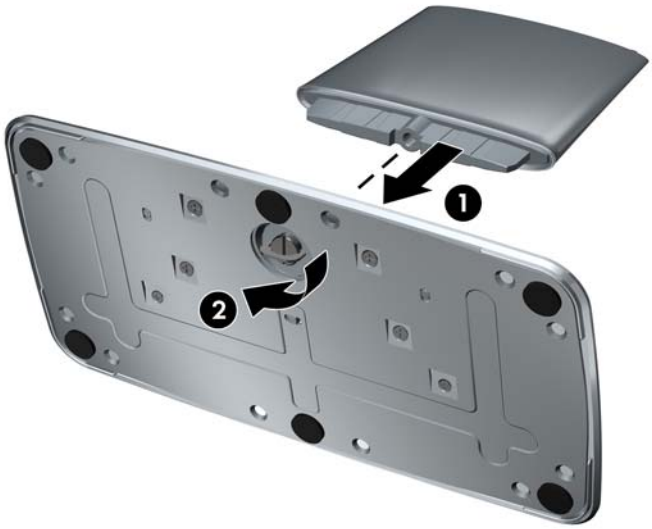
NOTE: For displays with glossy bezels, consider the placement of the display as the bezel may cause disturbing reflections from surrounding light and bright surfaces.

1. Set the monitor panel down on a flat, soft, protected table or desk surface.

CAUTION: The screen is fragile. Avoid touching or applying pressure to the LCD screen; doing so can cause damage.

2. Slide the pedestal into the slot on the base (1) and tighten the large screw on the bottom of the base (2) to secure the pedestal to the base.

Figure 3-1 Assembling the Base and Pedestal



3. Slide the monitor panel's hinge bracket into the opening on top of the pedestal. The panel will click into place when fully inserted.

Figure 3-2 Inserting the Monitor Panel

Connecting Monitor Cables

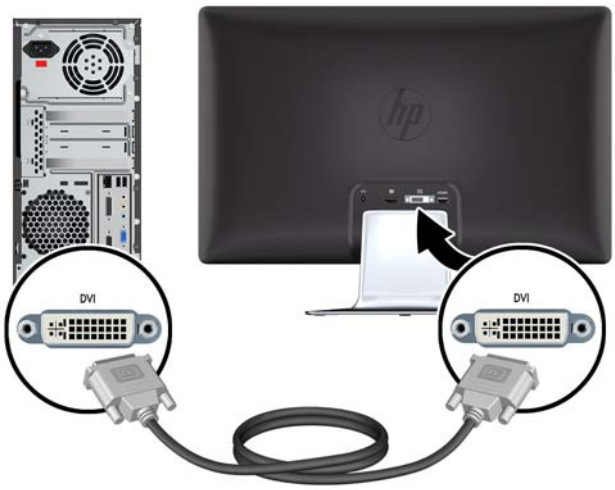
△ **CAUTION:** Before connecting cables to the monitor, ensure that the computer and monitor are powered off.

The video source is determined by the video cable used. The monitor will automatically determine which inputs have valid video signals. The inputs can be selected by pressing the source button on the front panel.

Connecting the DVI-D Video Cable

Connect one end of the DVI-D video cable to the back of the monitor and the other end to the DVI-D video connector on the computer. You can use this cable only if your computer has a DVI compliant graphics card that is either integrated or installed. The DVI-D cable is included.

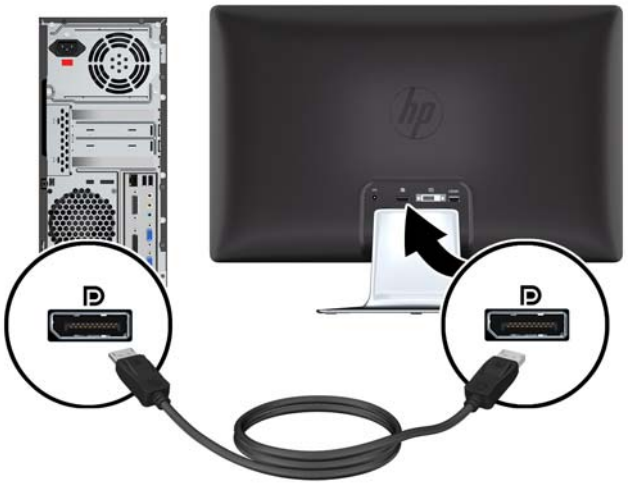
Figure 3-3 Connecting the DVI-D Cable



Connecting the DisplayPort Video Cable

Connect one end of the DisplayPort Digital Input cable to the back of the monitor and the other end connector to the input device. A DisplayPort Digital Input cable is provided on select models only.

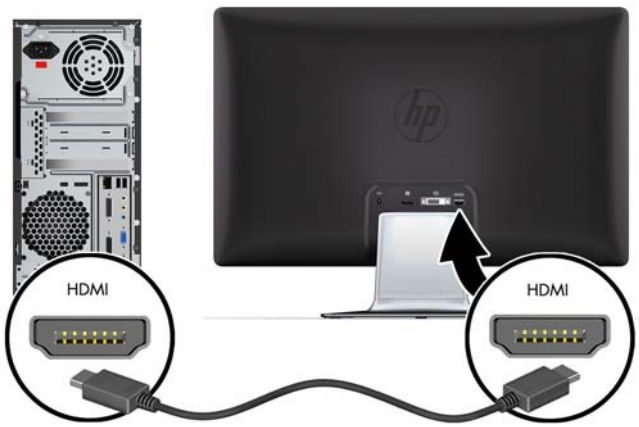
Figure 3-4 Connecting the DisplayPort Cable (cable provided on select models only)



Connecting the HDMI Cable (2310e Model Only)

Connect one end of the HDMI cable to the back of the monitor and the other end connector to the input device. An HDMI cable is provided on select models only.

Figure 3-5 Connecting the HDMI Cable (cable provided on select models only)



Connecting the Power Cord

1. Follow all electrical and power warnings

⚠ **WARNING!** To reduce the risk of electric shock or damage to your equipment:

Do not disable the power cord grounding plug. The grounding plug is an important safety feature. Plug the power cord into a grounded (earthed) electrical outlet.

Be sure that the grounded power outlet you plug the power cord into is easily accessible to the operator and located as close to the equipment as possible. A power cord should be routed so that it is not likely to be walked on or pinched by items that are placed upon it or against it.

Do not place anything on power cords or cables. Arrange them so that no one may accidentally step on or trip over them. Do not pull on a cord or cable.

See Technical Specifications on page 24 for additional information.

2. Connect the round end of the power supply cord to the monitor then connect one end of the power cord to the power supply and the other end to a grounded electrical outlet.

⚠ **WARNING!** To prevent injury from electrical shock, you should do one of the following if a properly grounded electrical outlet is not available: (1) You should use an electrical outlet adapter that provides proper grounding. (2) You should have a properly grounded electrical outlet installed.

Figure 3-6 Connecting the Power Cord

High-Bandwidth Digital Content Protection (HDCP)

Your monitor supports HDCP and can receive high-definition content. High-definition content is available in many sources, such as Blu-ray Disc devices or HDTV air or cable broadcasts. If you do not have an HDCP-enabled monitor, you will see a blank screen or a lower resolution picture when playing high-definition protected content. Your computer graphics card and monitor must both support HDCP to display protected content.

Turning on the Monitor

1. Press the power button on the computer to turn it on.
2. Press the power button on the front of the monitor to turn it on.

△ **CAUTION:** Burn-in image damage may occur on monitors that display the same static image on screen for a prolonged period of time.* To avoid burn-in image damage on the monitor screen, you should always activate a screen saver application or turn off the monitor when it is not in use for a prolonged period of time. Image retention is a condition that may occur on all LCD screens. Monitors with a “burned-in image” are not covered under HP warranty.

* A prolonged period of time is 12 consecutive hours of non-use.

When the monitor is powered on, a Monitor Status message is displayed for five seconds. The message shows which input is the current active signal, the status of the auto-switch source setting (On or Off), the default source signal, the current preset display resolution, and the recommended preset display resolution.

Selecting Video Input Connectors

The input connectors are:

- DisplayPort (digital)
- DVI-D connector (digital)
- HDMI connector (digital) 2310e model

The monitor automatically scans the signal inputs for an active input and uses that input for the display. If two inputs are active, the monitor will display the default input source. If the default source is not an active input, then the monitor will display the other input if it is active. You can change the default source in the OSD by pressing the front panel Menu button and selecting **Source Control** > **Default Source**.

Adjusting The Tilt

For optimal viewing, adjust the screen tilt to your own preference, as follows:

1. Face the front of the monitor and hold the base so that you do not topple the monitor while changing the tilt.

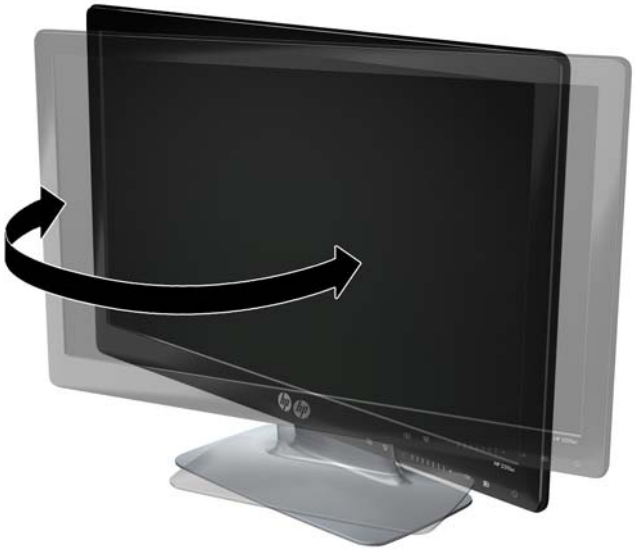
2. Adjust the tilt by moving the top edge of the monitor either toward or away from you, without touching the screen.

Figure 3-7 Tilt Adjustment

Adjusting the Swivel

The monitor allows a usable range of motion with the swivel feature.

Figure 3-8 Swivel Adjustment



△ **CAUTION:** To avoid breakage or other damage, avoid applying pressure to the LCD screen while swiveling it or changing the tilt.

4 Operating the Monitor

CD Software and Utilities

The CD that is included with this monitor contains drivers and software that you can install on your computer.

Installing Drivers

If you determine that you need to update the drivers, you can install the monitor driver INF and ICM files from the CD, or download them from the Internet.

Installing the monitor driver software from the CD

To install the monitor driver software from the CD:

1. Insert the CD in your computer CD drive. The CD menu appears.
2. Select the language.
3. Click **Install Monitor Driver Software**.
4. Follow the on-screen instructions.
5. Ensure that the proper resolutions and refresh rates appear in the Display Control Panel settings. Refer to the Windows® operating system documentation for more information.

NOTE: You might need to install the digitally signed monitor drivers (INF or ICM files) manually from the CD, in case of an installation error. Refer to the "Driver Software Readme" file on the CD for instructions (in English only).

Downloading updated drivers from the Internet

To download the latest version of drivers and software files from the HP Support site:

1. Refer to: http://www.hp.com/support.
2. Select your country/region.
3. Select **Download Drivers and Software**.
4. Enter the model number of your monitor. The software download pages for your monitor are displayed.
5. Download and install the driver and software files by following the instructions on the download pages.
6. Ensure that your system meets the requirements.

Front-Panel Controls

Control buttons are located on the bottom right of the monitor. The buttons are represented by icons that become illuminated when the bar area on the front panel is touched.

Button	Icon	Description
Source		Chooses the video input source from the computer.
Quick View		Opens the OSD Quick View menu where you can select a viewing mode.
Minus	–	Navigates down through the OSD menu and decreases adjustment levels.
Plus	+	Navigates up through the OSD menu and increases adjustment levels.
OK	OK	Enters the selected option in the OSD.
Menu		Opens, selects, or exits the OSD menu. **NOTE:** Pressing the Menu button for 10 seconds will disable operation of the remaining OSD buttons. Pressing it again for 10 seconds will re-enable functionality.
Power		Turns the monitor on or puts it in standby or sleep mode. The Power button is located on the bottom-right of the monitor. **NOTE:** Pressing the Power button for 10 seconds will disable operation of the Power button. Pressing it again for 10 seconds will re-enable functionality.

NOTE: The slider bars on the front panel between the Plus (+) and Minus (–) buttons can also be used for navigating menu items and making OSD control adjustments.

Using the On-Screen Display (OSD)

Use the On-Screen Display (OSD) to adjust the screen image based on your viewing preferences. To access the OSD, do the following:

1. If the monitor is not already on, press the Power button to turn on the monitor.
2. To access the OSD menu, press the Menu button. The OSD Main Menu displays.

NOTE: You need to touch the bar area on the front panel to display the front panel button icons.

3. To navigate through the Main or sub-menu, press the **+** (Plus) button on the monitor's front panel to scroll up, or the **–** (Minus) button to scroll in reverse. Then press the OK button to select the highlighted function.

NOTE: The menu moves to the top if you scroll down at the bottom of the selections. The menu moves to the bottom if you scroll up at the top of the selections.

NOTE: The slider bars on the front panel between the Plus (+) and Minus (–) buttons can also be used for navigating menu items and making OSD control adjustments.

4. To adjust the scale of a selected item, press the + or – button, or use the slider bar.
5. Select **Save and Return**. If you don't want to save the setting, select **Cancel** from the sub-menu or **Exit** from the Main Menu.
6. Press the Menu button to exit the OSD.

NOTE: When a menu is displayed, if the buttons are untouched for 30 seconds (factory default), adjustments and settings are saved and the menu closes.

OSD Menu Selections

The following table lists the on-screen display (OSD) menu selections and their functional descriptions. After changing an OSD menu item, and if the menu screen has these options, you may choose to:

- **Cancel** — to return to the previous menu level.
- **Save and Return** — to save all changes and return to the OSD Main Menu screen. This Save and Return option is active only if you change a menu item.
- **Reset** — to change back to the previous setting.

Icon	Main Menu Options	Sub-menu Options	Description
	Brightness		Adjusts the brightness level of the screen.
	Contrast		Adjusts the contrast level of the screen.
	Color		Selects the screen color. The factory default is 6500 K or Custom Color, depending on the model.
		6500 K	Changes to slightly reddish white.
		9300 K	Changes to slightly blueish white.

Icon	Main Menu Options	Sub-menu Options	Description
		sRGB	Sets your screen colors to adapt to the color standards used in the image technology industry.
		Quick View	Select from the following modes: Movie Photo Gaming Text Custom (settings saved when you adjust the Brightness, Contrast, or Color in one of the other Quick View options)
		Custom Color	Selects and adjusts your own color scales: R — Sets your own red color levels. G — Sets your own green color levels. B — Sets your own blue color levels.
	Image Control		Adjusts the screen image. Also enables or disables the ambient light sensor.
		Custom Scaling	Selects the method on how displayed information on the monitor will be formatted. Select: • Fill to Screen - image fills the entire screen and may look distorted or elongated because of non-proportional scaling of height and width. • Fill to Aspect Ratio - image is sized to fit the screen and maintains proportional image.
		Sharpness	Adjusts the screen image to look sharper or soft.
		Dynamic Contrast Ratio	Sets the Dynamic Contrast Ratio (DCR) setting on or off. The factory default setting is off. DCR automatically adjusts the balance between white and black levels to provide you with an optimal image.
	OSD Control		Adjusts the position of the OSD menu on the screen.
		Horizontal OSD Position	Changes the viewing position of the OSD menu to the left or right area of the screen. The factory default range is 94.
		Vertical OSD Position	Changes the viewing position of the OSD menu to the top or bottom area of the screen. The factory default range is 17.

Icon	Main Menu Options	Sub-menu Options	Description
		OSD Transparency	Adjust to view the background information through the OSD.
		OSD Timeout	Sets the time in seconds that the OSD is visible after the last button is pressed. The factory default is 30 seconds.
	Management		Selects the power-management features of the monitor.
		Power Saver	Enables the power saving feature (see Power-Saver Feature on page 20). Select: On Off The factory default is On.
		Power-On Recall	Restores power to the monitor following an unexpected removal of power. Select: On Off The factory default is On.
		Mode Display	Displays the resolution, refresh rate, and frequency information on the screen each time the OSD Main Menu is accessed. Select: On Off The factory default is On.
		Monitor Status	Displays the operating status of the monitor each time the monitor is powered on. Select the location at which to display the status: Top Middle Bottom Off The factory default is Top.

Icon	Main Menu Options	Sub-menu Options	Description
DDC		DDC/CI Support	Allows the computer to control some OSD menu features such as Brightness, Contrast, and Color Temperature. Select: On Off The factory default is On.
LED		Bezel Power LED	Turns the light (LED) in the Power button on and off. When set to off, the light will remain off at all times.
hp		Rear Logo LED	Turns the light (LED) on the rear logo on and off. When set to off, the light will remain off at all times.
		Sleep Timer	Provides the timer-adjustment menu options: Set Current Time — Sets the current time in hours and minutes. Set Sleep Time — Sets the time you want to place the monitor in sleep mode. Set On Time — Sets the time you want the monitor to wake up from sleep mode. Timer — Sets the Sleep Timer feature on or off; the default setting is Off. Sleep Now — Immediately sets the monitor to enter sleep mode.
	Language		Selects the language in which the OSD menu is displayed. The factory default is English.
i+	Information		Selects and displays important information about the monitor.
		Current Settings	Provides the current input video mode.
		Recommended Settings	Provides the recommended resolution mode and refresh rate for the monitor.
		Serial Number	Reports the serial number of the monitor. The serial number is needed if contacting HP technical support.
		FW Version	Reports the firmware version of the monitor.
		Backlight Hours	Reports the total hours of backlight operation.
		Service Support	For service support, go to: http://www.hp.com/support
	Factory Reset		Returns settings to factory defaults.

Icon	Main Menu Options	Sub-menu Options	Description
	Source Control		Selects the video input signal. the factory default by priority is DisplayPort, DVI, then HDMI.
		DVI	Selects DVI as the video input signal.
		HDMI (2310e model)	Selects HDMI as the video input signal.
		DisplayPort	Selects DisplayPort as the video input signal.
		Default Source	Selects the default or primary video input signal when the monitor is connected to two active and valid video sources. The monitor will automatically determine the video format.
		Auto Switch Source	Turns the system's automatic video signal input to On or Off. The factory default is On.
		Source Detection	This option is displayed in the OSD when a DisplayPort input is selected. You can set Source Detection to: • Always Active • Low Power The factory default is Low Power.
	Exit		Exits the OSD menu screen.

Identifying Monitor Conditions

Special messages appear on the monitor screen for the following monitor conditions:

- **Monitor Status**—When the monitor is powered on or when the input source signal is changed, a Monitor Status message is displayed for five seconds. The message shows which input is the current active signal, the status of the auto-switch source setting (On or Off), the default source signal, the current preset display resolution, and the recommended preset display resolution.
- **Input Signal Out of Range** — Indicates the monitor does not support the video card's input signal because its resolution or refresh rate are set higher than the monitor supports.

  Change your video card settings to a lower resolution or refresh rate. Restart your computer for the new settings to take effect.
- **Power Button Lockout**— Indicates the power button is locked. If the power button is locked, the warning message **Power Button Lockout** displays.

  If the power button is locked, press and hold the power button for 10 seconds to unlock the power button function.

  If the power button is unlocked, press and hold the power button for 10 seconds to lock out the power button function.
- **Monitor Going to Sleep** — Indicates the screen display is entering a sleep mode.

- **Check Video Cable** — Indicates a video input cable is not properly connected to the computer or monitor.
- **OSD Lockout** — The OSD can be enabled or disabled by pressing and holding the Menu button on the front panel for 10 seconds. If the OSD is locked, the warning message OSD Lockout appears for 10 seconds.

  If the OSD is locked, press and hold the Menu button for 10 seconds to unlock the OSD.

  If the OSD is unlocked, press and hold the Menu button for 10 seconds to lock the OSD.
- **Dynamic Contrast Ratio ON** – Indicates that DCR is turned on.
- **Dynamic Contrast Ratio OFF** – Indicates that DCR has been turned off in the OSD or was automatically turned off after changes were made to Brightness, Contrast, or Quick View in the OSD.
- **No Input Signal** — Indicates the monitor is not receiving a video signal from the computer on the monitor video input connector. Check to see if the computer or input signal source is off or in the power-saver mode.

Power-Saver Feature

When the monitor is in normal operating mode, the Power light is blue and the monitor uses the normal watts of power. For power usage, refer to Technical Specifications on page 24.

The monitor also supports a power-saver mode that is controlled by the computer. When the monitor is in the reduced-power state, the monitor screen is blank, the backlight is off, the Power light is amber, and the monitor uses minimum power. When the monitor is "awakened," a brief warm-up period occurs before the monitor returns to normal operating mode. The energy-saving reduced power state activates if the monitor does not detect either the horizontal sync signal or the vertical sync signal. The power-saver feature must be activated on your computer for this feature to work.

Refer to your computer documentation for instructions on setting energy-saver features (sometimes called power-management features).

NOTE: The energy-saver feature works only when the monitor is connected to computers that have energy-saver features.

A Troubleshooting

Solving Common Problems

The following table lists possible problems, the possible cause of each problem, and the recommended solutions:

Problem	Solution
Power LED is not on.	Make sure the Power button is on, and the power cord is properly connected to a grounded power outlet and to the monitor. Select **Management** in the OSD menu, and then select **Bezel Power LED**. Check if the Bezel Power LED option is set to Off and, if so, set to **On** mode.
Screen is blank.	Connect the power cord. Turn on the power. Connect the video cable properly. See Setting Up the Monitor on page 6 for more information. Press a key on the keyboard or move the mouse to turn off the screen-blanking utility.
Image appears blurred, indistinct, or too dark.	Press the Menu button to open the OSD menu, and adjust the brightness and contrast scales.
Check Video Cable appears on screen.	Connect the appropriate video cable (DisplayPort, DVI, or HDMI) between the computer and monitor. Be sure that the computer power is off while connecting the video cable.
Input Signal Out of Range appears on screen.	Restart your computer and enter Safe Mode. Change your settings to a supported setting (see the table in Preset Video Modes on page 25). Restart your computer so that the new settings take effect.
Picture is fuzzy and has ghosting, shadowing problem.	Adjust the contrast and brightness controls. Make sure that you are not using an extension cable or switch box. HP recommends plugging the monitor directly into the graphic card output connector on the back of your computer.
Unable to set the monitor to the optimal resolution.	Make sure the graphics card supports the optimal resolution. Make sure the latest supported driver is installed for the graphics card. For HP and Compaq systems, you can download the latest graphics driver for your system from: http://www.hp.com/support. For other systems, refer to the Web site for your graphics card.
Screen is black or displaying at a lower resolution while displaying high-definition (HD) content.	Check if your monitor and computer support HDCP. Refer to High-Bandwidth Digital Content Protection (HDCP) on page 10 or http://www.hp.com/support.

Problem	Solution
No Plug and Play.	In order for the Plug and Play feature of the monitor to work, you need a computer and graphic card that are compatible with Plug and Play. Check with your computer manufacturer. Check the monitor's video cable, and make sure that none of the pins are bent. Make sure that the monitor drivers are installed. Refer to Installing Drivers on page 13 for more information. Monitor drivers are also available at: http://www.hp.com/support.
Picture bounces, flickers, or wave pattern is present in the picture.	Move electrical devices that may cause electrical interference as far away from the monitor as possible. Use the maximum refresh rate that your monitor is capable of at the resolution that you are using.
Using HDMI connection, unable to hear audio.	The monitor does not provide an audio solution. The audio stream must be connected directly to external speakers or to an audio receiver.
Monitor is always in sleep mode (amber LED).	Power to the computer should be turned on. The computer graphic card should be snugly seated in its slot. Check that the monitor video cable is properly connected to the computer. Inspect the monitor video cable, and make sure that none of the pins are bent. Check that your computer is operational: Press the Caps Lock key and observe the Caps Lock LED found on most keyboards. The LED should either turn on or off after hitting the Caps Lock key.

Getting Support from hp.com

Before you contact customer service, refer to HP Technical Support at: http://www.hp.com/support Select your country/region, and then follow the links to the support page for your monitor.

Preparing to Call Technical Support

If you cannot solve a problem by using the troubleshooting tips in this section, you might have to call technical support. For technical support contact information, refer to the printed documentation included with the monitor.

Have the following information available when you call:

- Monitor model number (located on label on back of monitor)
- Monitor serial number (located on label on back of monitor or in the OSD display in the Information menu)
- Purchase date on invoice
- Conditions under which the problem occurred
- Error messages received
- Hardware configuration
- Name and version of hardware and software you are using

Locating the Rating Label

The rating label on the monitor provides the product number and serial number. You may need these numbers when contacting HP about your monitor model.

The rating label is on the back of the monitor.

B Technical Specifications

All specifications represent the typical specifications provided by HP's component manufacturers; actual performance may vary either higher or lower.

HP LCD Monitors

Table B-1 2310e/2310ei Specifications

Specifications	
Display Type:	TFT LCD active matrix
Viewable Image Size:	58.42 cm (23.0 in.) diagonal
Video Input Terminals:	2310ei: DisplayPort, DVI; 2310e: DisplayPort, DVI, HDMI
Tilt:	-5° to +25°
Maximum Weight (unpacked):	4.3 kg (9.5 lb)
Dimensions (h x w x d):	415.9 x 557.9 x 148.5 mm (16.37 x 21.96 x 5.85 in.)
Maximum Graphics Resolution:	1920 x 1080 @ 60 Hz
Optimum Graphics Resolution:	1920 x 1080 @ 60 Hz
Text Mode:	720 x 400
Pixel Pitch:	0.265 x 0.265 mm
Horizontal Frequency:	24 to 94 kHz
Vertical Frequency:	50 to 76 Hz
Operating Temperature:	5° to 35° C (41° to 95° F)
Non-Operating Humidity:	-20° to 60° C (-4° to 140° F)
Operating Humidity:	20% to 80%
Non-Operating Humidity:	5% to 95%
Operating Altitude:	0 to 3,658 meters (0 to 12,000 feet)
Storage Altitude:	0 to 12,192 meters (0 to 40,000 feet)
Power Source:	100–240 VAC (ca), 50/60 Hz
Maximum Power Consumption:	28 watts (W)
Typical Power Consumption:	22 watts (W)
Sleep Power Consumption:	<2 watts (W)

Preset Video Modes

The monitor automatically recognizes many preset video input modes that will appear properly sized and centered on the screen.

Table B-2 Factory Preset Video Input Modes

Preset	Resolution	Horizontal Frequency (kHz)	Vertical Frequency (Hz)
1	640 x 480	31.469	59.94
2	720 x 400	31.469	70.087
3	800 x 600	37.879	60.317
4	1024 x 768	48.363	60.004
5	1280 x 720	45.00	60.00
6	1280 x 960	60.00	60.00
7	1280 x 1024	63.98	60.02
8	1440 x 900	55.94	59.89
9	1600 x 1200	75.00	60.00
10	1680 x 1050	65.29	60.00
11	1920 x 1080	67.50	60.00

Table B-3 HDMI High Definition Factory Preset Video Modes (2310e Model Only)

Preset	HD Video Display Resolution	Resolution	Horizontal Frequency (kHz)	Vertical Frequency (Hz)
1	480p	720 x 480	31.469	60
2	720p60	1280 x 720	45	60
3	576p	720 x 576	31.25	50
4	720p50	1280 x 720	37.5	50
5	1080p60	1920 x 1080	67.5	60
6	1080p50	1920 x 1080	56.25	50

Entering User Modes

The video controller signal may occasionally call for a mode that is not preset if:

- You are not using a standard graphics adapter.
- You are not using a preset mode.

It this occurs, you may need to readjust the parameters of the monitor screen by using the on-screen display. Your changes can be made to any or all of these modes and saved in memory. The monitor automatically stores the new setting, then recognizes the new mode just as it does a preset mode. In addition to the factory preset modes, there are at least ten user modes that can be entered and stored.

LCD Monitor Quality and Pixel Policy

Your LCD Monitor uses high-precision technology, manufactured according to high standards, to help guarantee trouble-free performance. Nevertheless, the display may have cosmetic imperfections that appear as small bright or dark spots. This is common to all LCD displays used in products supplied by all vendors and is not specific to your LCD Monitor. These imperfections are caused by one or more defective pixels or subpixels.

A pixel consists of one red, one green, and one blue subpixel. A defective whole pixel is always turned on (a bright spot on a dark background), or it is always off (a dark spot on a bright background). The first is the more visible of the two. A defective subpixel (dot defect) is less visible than a defective whole pixel, and is small and only visible on a specific background.

To locate defective pixels, the monitor should be viewed under normal operating conditions and in normal operating mode at a supported resolution and refresh rate, from a distance of approximately 50 cm (16 inches). We expect that, over time, the industry will continue to improve its ability to produce displays with fewer cosmetic imperfections, and we will adjust guidelines as improvements are made.

For more information about your LCD Monitor and pixel policy, refer to the HP Web site at: http://www.hp.com/support. To find pixel policy information on the HP Web site, type in "HP Pixel Policy" in the search box and press Enter.

C Agency Regulatory Notices

Federal Communications Commission Notice

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and the receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio or television technician for help.

Modifications

The FCC requires the user to be notified that any changes or modifications made to this device that are not expressly approved by Hewlett Packard Company may void the user's authority to operate the equipment.

Cables

Connections to this device must be made with shielded cables with metallic RFI/EMI connector hoods to maintain compliance with FCC Rules and Regulations.

Declaration of Conformity for Products Marked with the FCC Logo (United States Only)

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:

1. This device may not cause harmful interference.
2. This device must accept any interference received, including interference that may cause undesired operation.

For questions regarding the product, contact:

Hewlett Packard Company

P. O. Box 692000, Mail Stop 530113

Houston, Texas 77269-2000

Or, call 1-800-HP-INVENT (1-800 474-6836)

For questions regarding this FCC declaration, contact:

Hewlett Packard Company

P. O. Box 692000, Mail Stop 510101

Houston, Texas 77269-2000

Or, call (281) 514-3333

To identify this product, refer to the Part, Series, or Model number found on the product.

Canadian Notice

This Class B digital apparatus meets all requirements of the Canadian Interference-Causing Equipment Regulations.

Avis Canadien

Cet appareil numérique de la classe B respecte toutes les exigences du Règlement sur le matériel brouilleur du Canada.

European Union Regulatory Notice

Products bearing the CE marking comply with the following EU Directives:

- Low Voltage Directive 2006/95/EC
- EMC Directive 2004/108/EC
- Ecodesign Directive 2009/125/EC, where applicable

CE compliance of this product is valid if powered with the correct CE-marked AC adapter provided by HP.

Compliance with these directives implies conformity to applicable harmonized European standards (European Norms) that are listed in the EU Declaration of Conformity issued by HP for this product or product family and available (in English only) either within the product documentation or at the following web site: http://www.hp.eu/certificates (type the product number in the search field).

The compliance is indicated by one of the following conformity markings placed on the product:

CE	For non-telecommunications products and for EU harmonized telecommunications products, such as Bluetooth® within power class below 10mW.
CE !	For EU non-harmonized telecommunications products (If applicable, a 4-digit notified body number is inserted between CE and !).

Please refer to the regulatory label provided on the product.

The point of contact for regulatory matters is: Hewlett-Packard GmbH, Dept./MS: HQ-TRE, Herrenberger Strasse 140, 71034 Boeblingen, GERMANY.

German Ergonomics Notice

HP products which bear the "GS" approval mark, when forming part of a system comprising HP brand computers, keyboards and monitors that bear the "GS" approval mark, meet the applicable ergonomic requirements. The installation guides included with the products provide configuration information.

Japanese Notice

この装置は、クラスB情報技術装置です。この装置は、家庭環境で使用することを目的としていますが、この装置がラジオやテレビジョン受信機に近接して使用されると、受信障害を引き起こすことがあります。取扱説明書に従って正しい取り扱いをして下さい。

VCCI-B

Korean Notice

B급 기기 (가정용 방송통신기기)	이 기기는 가정용(B급)으로 전자파적합등록을 한 기기로서 주로 가정에서 사용하는 것을 목적으로 하며, 모든 지역에서 사용할 수 있습니다.

Power Cord Set Requirements

The monitor power supply is provided with Automatic Line Switching (ALS). This feature allows the monitor to operate on input voltages between 100–120V or 200–240V.

The power cord set (flexible cord or wall plug) received with the monitor meets the requirements for use in the country where you purchased the equipment.

If you need to obtain a power cord for a different country, you should purchase a power cord that is approved for use in that country.

The power cord must be rated for the product and for the voltage and current marked on the product's electrical ratings label. The voltage and current rating of the cord should be greater than the voltage

and current rating marked on the product. In addition, the cross-sectional area of the wire must be a minimum of 0.75 mm² or 18 AWG, and the length of the cord must be between 6 feet (1.8 m) and 12 feet (3.6 m). If you have questions about the type of power cord to use, contact an authorized HP service provider.

A power cord should be routed so that it is not likely to be walked on or pinched by items placed upon it or against it. Particular attention should be paid to the plug, electrical outlet, and the point where the cord exits from the product.

Japanese Power Cord Requirements

For use in Japan, use only the power cord received with this product.

△ **CAUTION:** Do not use the power cord received with this product on any other products.

Product Environmental Notices

ENERGY STAR® Qualification

HP Displays marked with the ENERGY STAR® certification mark meet the requirements of the U.S. Environmental Protection Agency (EPA) ENERGY STAR program. The EPA ENERGY STAR® certification mark does not imply endorsement by the EPA. As an ENERGY STAR Partner, Hewlett Packard Company has determined that this product meets the ENERGY STAR® program requirements for display energy efficiency.

The following ENERGY STAR® certification mark appears on all ENERGY STAR qualified displays:

The ENERGY STAR® program specifications for displays and computers were created by the EPA to promote energy efficiency and reduce air pollution through more energy-efficient equipment in homes, offices, and factories. One way products achieve this goal is by using the Microsoft Windows power management feature to reduce power consumption when the product is not in use.

The power management feature enables the computer to initiate a low-power or “sleep” mode after a period of user inactivity. When used with an external ENERGY STAR® qualified display, this feature also supports similar power management features for the display. To take advantage of these potential energy savings, users should use the default power management settings that are provided with ENERGY STAR qualified computers and displays. The default power management settings on ENERGY STAR qualified computers are preset to behave in the following ways when the system is operating on AC power:

- Turn off an external display after 15 minutes of user inactivity
- Initiate a low power sleep mode for the computer after 30 minutes of user inactivity

ENERGY STAR® qualified computers exit the low power sleep mode and ENERGY STAR qualified displays resume operation when the user resumes use of the computer. Examples include the user

pressing the power/sleep button, receiving an input signal from an input device, receiving an input signal from a network connection with the Wake On LAN (WOL) feature enabled, etc.

Additional information on the ENERGY STAR® program, its environmental benefits and the potential energy and financial savings of the power management feature can be found on the EPA ENERGY STAR Power Management Web site at http://www.energystar.gov/powermanagement.

Disposal of Waste Equipment by Users in Private Household in the European Union

This symbol on the product or on its packaging indicates that this product must not be disposed of with your household waste. Instead, it is your responsibility to dispose of your waste equipment by handing it over to a designated collection point for the recycling or waste electrical and electronic equipment. The separate collection and recycling of your waste equipment at the time of disposal will help to conserve natural resources and ensure that it is recycled in a manner that protects human health and the environment. For more information about where you can drop off your waste equipment for recycling, please contact the local city office, the household waste disposal service or the shop where you purchased the product.

Chemical Substances

HP is committed to providing our customers with information about the chemical substances in our products as needed to comply with legal requirements such as REACH (Regulation EC No 1907/2006 of the European Parliament and Council). A chemical information report for this product can be found at http://www.hp.com/go/reach.

HP Recycling Program

HP encourages customers to recycle used electronic hardware, HP original print cartridges, and rechargeable batteries. For more information about recycling programs, go to http://www.hp.com/recycle.

Restriction of Hazardous Substances (RoHS)

A Japanese regulatory requirement, defined by specification JIS C 0950, 2005, mandates that manufacturers provide Material Content Declarations for certain categories of electronic products offered for sale after July 1, 2006. To view the JIS C 0950 material declaration for this product, visit http://www.hp.com/go/jisc0950.

2008年、日本における製品含有表示方法、JISC0950が公示されました。製造事業者は、2006年7月1日以降に販売される電気・電子機器の特定化学物質の含有につきまして情報提供を義務付けられました。製品の部材表示につきましては、www.hp.com/go/jisc0950を参照してください。

有毒有害物质/元素的名称及含量表

根据中国
《电子信息产品污染控制管理办法》

液晶显示器

部件名称	有毒有害物质和元素					
	铅 (Pb)	汞 (Hg)	镉 (Cd)	六价铬 (Cr(VI))	多溴联苯 (PBB)	多溴二苯醚 (PBDE)
液晶显示器显示面板	X	X	O	O	O	O
机箱/其它	X	O	O	O	O	O

CRT 显示器

部件名称	有毒有害物质和元素					
	铅 (Pb)	汞 (Hg)	镉 (Cd)	六价铬 (Cr(VI))	多溴联苯 (PBB)	多溴二苯醚 (PBDE)
阴极射线管	X	O	O	O	O	O
机箱/其它	X	O	O	O	O	O

O：表示该有毒或有害物质在该部件所有均质材料中的含量均在 SJ/T11363-2006 标准规定的限量要求以下。

X：表示该有毒或有害物质至少在该部件所用的某一均质材料中的含量超出 SJ/T11363-2006 标准规定的限量要求。

表中标有“X”的所有部件都符合欧盟 RoHS 法规 — “欧洲议会和欧盟理事会 2003 年 1 月 27 日关于电子电器设备中限制使用某些有害物质的 2002/95/EC 号指令”。

注：环保使用期限的参考标识取决于产品正常工作的温度和湿度等条件。

Turkey EEE Regulation

In Conformity with the EEE Regulation

EEE Yönetmeliğine Uygundur